

Summary of the Marbled Murrelet Nesting Habitat Meeting
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Meeting Overview

The team spent a few minutes discussing budgets. Kim Nelson gave an overview of her work with Bill Ripple using aerial photography interpretation of 41 nest vs 41 random sites. We then continued working on the different aspects of the models.

1. Budget Overview. NB showed monitoring budget estimates. These are estimates that will be continually refined. NB will talk to Kathy Geyer about 100k coming from R6 to PNW. Sherri et al. may give me info on GIS support.
2. Kim's presentation. Nonmap model aerial photo interpretation. 41 nest sites compared to 41 random sites. Kim will talk with Bill Ripple about including the remnants. Progress report due April 1. Team wants a copy of it. End product due? NB will look up contract agreement. Would likely be the progress report if no other funding is provided.
3. Continue work on models.

DATA SOURCE PROBLEMS

Discussion of problems associated data sources. SM showed stands and survey sites. Some sites not were not layed out according to protocol. She needs to understand what and how she can use what she's got. Some areas surveyed every 400m. This bogs down the site analysis because the site is not defined the same way. CA has different sampling designs and units. We need to figure out the magnitude of the problem. Determine what if anything we could do to go back and make the data usable. SM will see how many sites are 150 acre and 200 acre.

OR & WA may have more stations (more than 4) per site. That's not a problem, but there may be a problem of scale also. Check into Tom's data set. Oregon Data set in general

SM - only about 5% of their data set shows how the sites are laid out. Would be a major undertaking to go back.

Presence detections will not be used because:

1. Can't tie them to a site.
2. Variable amount of survey effort (although you might be able to adjust by accounting for number of detections per visit).
3. When it's a continuous variable like detections (vs binomial), its very difficult to account for quality assurance.

Number of Occupancy Detections: SM wants to look into this for CA because they have a lot of sites where they continued surveys after getting occupancy.

For the nonmap, use vs avail, we won't have the independent variables for the sites where we have the dependent variables.

Discussion Points for Murrelet Models

	Map Model		Non-map Model	
Definition	Use vs. Avail.	Use vs. Nonuse	Use vs. Avail.	Use vs. Nonuse
Dependent Variables	Occupied analyzed separate from known nest sites OR Model built with occupancy and reserve nest sites for a partial validation	Occupied vs absence (only those done to protocol). Sherri concerned CA may not have many absence sites if we stick to 4 visits x 2 yrs. *note discussion above	Occupied analyzed separate from known nest sites OR Model built with occupancy and reserve nest sites for a partial validation	Occupied vs absence Nest vs Nonnest
Basic Model Form	Logistic regression for occupancy and nest sites	Logistic regression for occupancy	Logistic regression for occupancy and nest sites	Logistic regression for occupancy and nest sites
Clear expectations of what is possible for models	*Deferred some of this discussion. Produce a 'probability of occupancy' map with a clear understanding of precision/level of confidence. (E.g., we're 75% sure an area is mamu habitat +- 3% error).	Produce a 'probability of occupancy' map with a clear understanding of precision/level of confidence. (E.g., we're 75% sure an area is mamu habitat +- 3% error).	Predict the best 'probability of occupancy' on a site level (knowing something about a particular site) Examine other models for the biological meaning of parameters and potentially find	Predict the best 'probability of occupancy' on a site level (knowing something about a particular site)

	Map Model		Non-map Model	
Definition	Use vs. Avail.	Use vs. Nonuse	Use vs. Avail.	Use vs. Nonuse
			surrogate measurements that are cheaper, or more readily available.	
Potential Uses of the Model			<p>Estimates habitat quantities.</p> <p>Tracking habitat changes over time.</p> <p>Determine likelihood of murrelet occupancy (maybe a possible tool at a watershed scale planning effort.)</p> <p>Potentially obviating the need for surveys at a site.</p> <p>(Model evaluation will reflect on the appropriateness of the models for these uses.)</p>	Estimates habitat quantities
Independent Variables	<p>Quadratic mean diameter for the dominates and co-dominants</p> <p>Structure (simple vs.</p>	Quadratic mean diameter for the dominates and co-dominants	<p>Start with Kim/Tom's plot data:</p> <p>tree density</p> <p>mean tree diameter</p>	<p>Start with Kim/Tom's plot data:</p> <p>tree density</p> <p>mean tree diameter</p>

	Map Model		Non-map Model	
Definition	Use vs. Avail.	Use vs. Nonuse	Use vs. Avail.	Use vs. Nonuse
	<p>complex)</p> <p>% Cover (conifer canopy)</p> <p>Topographic variables (slope, aspect, elevation, distance to ocean, distance to fresh water, *deferred discussion on distance to nearest similar habitat (how do you characterize “similar” and how do you decide the nearest distance”...))</p> <p>Site size (as determined by number of stations assumed to be 30 acres unless you know the actual)</p>	<p>Structure (simple vs. complex)</p> <p>% Cover (conifer canopy)</p> <p>Topographic variables (slope, aspect, elevation, distance to ocean, distance to fresh water, *deferred discussion on distance to nearest similar habitat (how do you characterize “similar” and how do you decide the nearest distance”...))</p> <p>Site size (as determined by number of stations assumed to be 30 acres unless you know the actual)</p>	<p>platform density</p> <p>moss abundance</p> <p>tree height</p> <p>(dominant, mid and low canopy)</p> <p>canopy cover</p> <p>slope</p> <p>aspect</p> <p>elevation</p> <p>distance to coast</p> <p>distance to stream</p> <p>distance to openings</p> <p>mistletoe</p> <p>CVS/FIA/BLM</p> <p>(stand exam data might help describe characteristics at some use sites)</p>	<p>platform density</p> <p>moss abundance</p> <p>tree height</p> <p>(dominant, mid and low canopy)</p> <p>canopy cover</p> <p>slope</p> <p>aspect</p> <p>elevation</p> <p>distance to coast</p> <p>distance to stream</p> <p>distance to openings</p> <p>mistletoe</p> <p>CVS/FIA/BLM</p> <p>NEST VARIABLES: mean platform diameter horizontal cover, etc.</p> <p>(stand exam data might help describe characteristics at some both use and nonuse sites)</p>

	Map Model		Non-map Model	
Definition	Use vs. Avail.	Use vs. Nonuse	Use vs. Avail.	Use vs. Nonuse
Issues of scale	<p>Same scale as protocol (a site: up to 120 acres)</p> <p>A. 400m radius circle centered at the center (geometric mean) of the stations</p> <p>OR</p> <p>B. 400m radius circle centered at the center of the site (need to get a cost estimate for this)</p> <p>Need to determine how this will be made consistent, objective, and well-defined.</p> <p>Time frame: 2 months.</p>	<p>Same scale as protocol (a site: up to 120 acres)</p> <p>A. 400m radius circle centered at the center (geometric mean) of the stations</p> <p>OR</p> <p>B. 400m radius circle centered at the center of the site (need to get a cost estimate for this)</p>	<p>Scale of a given site. Independent variables put on a per unit basis</p>	<p>Scale of a given site. Independent variables put on a per unit basis</p>

	Map Model		Non-map Model	
Definition	Use vs. Avail.	Use vs. Nonuse	Use vs. Avail.	Use vs. Nonuse
Combining scale and independent variables	<p>About 800 pixels per site.</p> <p>Quadratic mean diameter for the dominates and co-dominants: (mean % of pixels > some value (50,70)cm Any (1,5,10) pixels with > (50,70)cm)</p> <p>Structure (simple vs. complex)</p> <p>% Cover (conifer canopy) (Mean Mean % per pixels % of pixels > some value (10%,50%,80%))</p> <p>Topographic variables (slope, aspect, elevation, distance to ocean, distance to fresh water, * deferred distance to nearest similar habitat...) means % of pixels with slope < (5,10)% std. dev. of slope</p>	<p>About 800 pixels per site.</p> <p>Quadratic mean diameter for the dominates and co-dominants: (mean % of pixels > some value (50,70)cm Any (1,5,10) pixels with > (50,70)cm)</p> <p>Structure (simple vs. complex)</p> <p>% Cover (conifer canopy) (Mean Mean % per pixels % of pixels > some value (10%,50%,80%))</p> <p>Topographic variables (slope, aspect, elevation, distance to ocean, distance to fresh water, * deferred distance to nearest similar habitat...) means</p>	N/A	N/A

	Map Model		Non-map Model	
Definition	Use vs. Avail.	Use vs. Nonuse	Use vs. Avail.	Use vs. Nonuse
	* Deferred Fragstat statistics: patch size, spatial patterns, etc.	% of pixels with slope < (5,10)% std. dev. of slope * Deferred Fragstat statistics: patch size, spatial patterns, etc.		
Reference Population	Temporal: How far back to use data. Using 1995 and more recent (unless 1994 data was first of 2 years). Also date of stand exam data. Spatial: Split WA&OR from CA	Temporal: How far back to use data. Using 1995 and more recent (unless 1994 data was first of 2 years). Also date of stand exam data. Spatial: Split WA&OR from CA	Temporal: How far back to use data. Using 1995 and more recent (unless 1994 data was first of 2 years). Also date of stand exam data.	Temporal: How far back to use data. Using 1995 and more recent (unless 1994 data was first of 2 years). Also date of stand exam data.
Variable Selection	All Possible Subsets using AIC with a screening process built-in	All Possible Subsets using AIC with a screening process built-in	All Possible Subsets using AIC with a screening process built-in	All Possible Subsets using AIC with a screening process built-in
Model Evaluation	This is a kind of statistical/mathematical evaluation done without ground data (no new info). First answer: what is the model supposed to do? How well does it need to	This is a kind of statistical/mathematical evaluation done without ground data (no new info). First answer: what is the model supposed to do? How well does it	This is a kind of statistical/mathematical evaluation done without ground data (no new info). First answer: what is the model supposed to do? How well does it	This is a kind of statistical/mathematical evaluation done without ground data (no new info). First answer: what is the model supposed to do? How well does it

	Map Model		Non-map Model	
Definition	Use vs. Avail.	Use vs. Nonuse	Use vs. Avail.	Use vs. Nonuse
	perform that function?	need to perform that function?	need to perform that function?	need to perform that function?
Further Model Development	May need to go back and fill gaps (this also could occur during the model development stage)	May need to go back and fill gaps (this also could occur during the model development stage)	May need to go back and fill gaps (this also could occur during the model development stage)	May need to go back and fill gaps (this also could occur during the model development stage)
Model Validation	Getting more info or saving some portion of the data set (nest sites) to help validate. May need to get both habitat and bird-use. Problem is that some sites may not show birds because of biological reasons. Surveys may be the best method since it gives info about the bird use (occupancy) . Need to have a large enough sample size to capture standard important combinations of the independent variables that are important to you.	Getting more info or saving some portion of the data set (nest sites) to help validate. May need to get both habitat and bird-use. Problem is that some sites may not show birds because of biological reasons. Surveys may be the best method since it gives info about the bird use (occupancy) . Need to have a large enough sample size to capture standard important combinations of the independent variables that are important to you.	Additional information gathering is likely to be necessary.	Additional information gathering is likely to be necessary.

To Do List

1. KN and NB get an assessment of Oregon database for occupancy and absence sites. What's there. What years? NB talk to Tom Hamer. What does he have? Who did he get it from? Does he have the raw data sheets. Did he get a data base? Or make one? How does it match with the full data set for OR? Consider the distribution. Kim will get latest copy of ODFW data base.
2. Randy will continue working on the WDFW database.
3. Sherri/Diane checking on the most feasible way of centering the 400m circles.
4. Sherri checking on the number of 150 acre, 200 acre stands (generally the size of sites or the scale at which surveys were done).
5. All are welcome to give Naomi additional budget information.

Next Meeting

The next meeting will be scheduled when we have more information on the data sets.